

REMARKS

Claims 1-14 are currently pending in the application for the Examiner's review and reconsideration, all of which have been rejected. The specification has been amended to insert subheadings for each of the sections (FIELD OF THE INVENTION, BACKGROUND, BRIEF DESCRIPTION OF THE DRAWINGS, BRIEF DESCRIPTION OF THE INVENTION, and EXAMPLES. The embedded figure on page 21 has been deleted and replaced on a separate sheet with the subheading FIGURES. No new matter has been added by these amendments to the specification. Claims 1, 6, 7, 11, and 14 have been amended to more clearly define the claimed subject matter. Claim 12 has been canceled without prejudice in order to expedite examination. Applicants acknowledge and appreciate the Examiner indicating that claim 9 contains allowable subject matter. Reconsideration and allowance of the claims is respectfully requested in view of the foregoing amendment and the following remarks.

Objections to the Specification.

The disclosure is objected to because of the following informalities: (I) the absence of section headings in accord with Rule 77(b); (II) the presence of an embedded figure (Figure 1 on p. 21) in violation of Rule 58(a) (which states the specification shall not contain drawings) and (III) the absence of a brief description of the drawing as per Rule 74. Applicants have amended the specification to insert subheadings for each of the sections (FIELD OF THE INVENTION, BACKGROUND, BRIEF DESCRIPTION OF THE DRAWINGS, BRIEF DESCRIPTION OF THE INVENTION, and EXAMPLES. The embedded figure on page 21 has been deleted and replaced on a separate sheet with the subheading FIGURES. Accordingly, applicants submit that the specification complies with Rules 77(b), 58(a), and 74 and respectfully request withdrawal of the objection.

Rejections under 35 U.S.C. §112, second paragraph.

Claims 1-14 were rejected under 35 U.S.C. 112, second paragraph as allegedly being indefinite as set forth on pages 2-4 of the Office Action. Particularly, the Examiner asserts that the recitation in claims 1, 6, 7, and 11 of a broad range/limitation followed by the linking term "preferably" and then a narrower statement of the range renders the claims indefinite. In response applicants have amended the claims to delete any such phrases or terms that start

with “preferably” Applicants submit that the claims inventions in claim 1, 6, 7, and 11, as amended more clearly define the claimed subject matter. With respect to claim 14, the Examiner asserts that the phrase “it does not relate to a formulation comprising” is vague and indefinite. In response applicants have amended claim 14 to recite “said formulation not being” to more clearly define the claimed subject matter. Applicants submit that the claimed invention, as amended, clearly defines the claimed subject matter and respectfully request withdrawal of the rejections of claims 1-14 under 35 U.S.C. 112, second paragraph.

Rejections under 35 U.S.C. §102(b) as anticipated

Claims 1, 4, 6-8, 10, 11, and 12 were rejected under 35 U.S.C. 102(b) as allegedly anticipated by Farber et al (US 3,778,422) as set forth on page 5-6 of the Office Action. Claims 1, 4-6, 8, 11, and 12 were rejected under 35 U.S.C. 102(b) as allegedly anticipated by Mahlo (US 3,451,985) as set forth on page 6-7 of the Office Action. Claim 14 was rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Meyer et al (US 3,787,527) as set forth on pages 12-14 of the Office Action. According to the Examiner Farber et al discloses an aqueous suspension polymerization process for preparing vinyl chloride polymer, wherein the mixture of di-sec-butyl peroxydicarbonate or di-isopropyl peroxydicarbonate and tert-butyl hydroperoxide were used as polymerization initiators. The Examiner asserts that the prior art teaches the identical chemical composition as claimed, the properties applicants disclose and/or claim are necessarily present therein. With respect to Mahlo the Examiner asserts that the reference describes an aqueous suspension polymerization process for preparing vinyl chloride polymer, wherein a charge of 0.4 part of di-isopropyl peroxydicarbonate initiator and diethyl maleate solvent were slowly fed to the high pressure line leading to the polymerization reactor. According to the Examiner the identical species of organic peroxide used in the aqueous suspension polymerization exemplified in Mahlo is reasonably presumed to inherently meet the solubility limitation of peroxydicarbonates as recited in the claimed invention. With respect to Meyer the Examiner asserts that the reference is directed to a mixture of a perester and a tertiary hydroperoxide as setting catalyst for unsaturated polyester resins, the weight ratio of the perester to the tertiary hydroperoxide being from 90:10 to 10:90. According to the Examiner claim 14 is broadly construed as readable on the disclosed mixtures containing an accelerator compound and accelerator-free

mixtures of the perester (II) and the hydroperoxid (V) are also disclosed by Meyer. Therefore, the Examiner asserts, the perester species of Meyer within the presently claimed peroxide mixtures in amounts within the ambit of applicants' "effective amount" would inherently function as "controlling agent" as claimed.

Applicants submit that the currently claimed invention as in claim 1 requires that the process of the present invention is an aqueous dispersion polymerization process wherein at least part of the one or more organic peroxides used as initiator is dosed to the reaction mixture at the polymerization temperature. Such a process is not disclosed by Farber (US 3,778,422). In Example 1, di-sec-butyl peroxydicarbonate, butyl hydroperoxide, and vinyl chloride were charged to an autoclave containing water, sodium bicarbonate, and methylcellulose. Only then, the temperature was brought to 132°F, at which temperature the polymerization was conducted (col. 3, lines 55-70). In other words, the peroxydicarbonate in this Example was already present in the reaction mixture before the polymerization temperature was applied. No peroxydicarbonate, peroxyester, or diacylperoxide was dosed at the polymerization temperature, as required in the claimed invention.

The other Examples in Faber et al follow the same procedure: first introducing peroxide, then heating to the polymerization temperature, and no dosing of peroxydicarbonate, peroxyester, or diacylperoxide at the polymerization temperature. Thus, a process according to claim 1, involving dosing of peroxydicarbonate, peroxyester, or diacylperoxide to the reaction mixture at the polymerization temperature is not disclosed Farber et al.

With respect to Mahlo, in Example 1 a formulation of 40 wt% diisopropyl peroxydicarbonate dissolved in diethyl maleate is added to the reaction mixture. This formulation thus contains 40 wt% peroxydicarbonate and 60 wt% diethyl maleate, which means that, based on the weight of organic peroxide, diethyl maleate is used in an amount of 150 wt%. In contrast claim 1 of the presently claimed invention requires the controlling agent to be used in an "effective amount". For ethylenically unsaturated controlling agents, this means amounts of 4-45 wt%, based on the weight of organic peroxide (see page 8, line 27 through page 9, line 1 of the PCT publication), which is significantly lower than the 150 wt% disclosed by Mahlo. Thus, a process according to claim 1, involving the use of an effective amount of controlling agent, is not disclosed by Mahlo.

Further, claim 14 relates to a formulation suitable for use in an aqueous dispersion polymerization process of claim 8. This does not merely identify a future use, but requires the formulation to be suitable for said use. The formulations of Table I of Meyer et al are prepared by adding the peroxides and accelerator to a resin. This formulation, which thus contains resin and accelerator is not suitable for dosing to the aqueous dispersion polymerization process of claims 1-8. Furthermore, these formulations contain the hydroperoxide, based on peroxyester, in amounts of 11-900 wt% (10:90-90:10), 25-400 wt% (20:80-80:20), and 100 wt% (50:50), which significantly exceeds the effective amount of 0.3-3 wt% for hydroperoxide controlling agents according to the presently claimed invention (see page 8, lines 25-27 of the PCT publication). Thus for these reasons claim 14 is not disclosed by Meyer et al.

Therefore, Applicants submit that the currently claimed invention is not anticipated by Faber et al, Mahlo or Meyer et al. Withdrawal of the rejection of claims 1, 4, 6-8, 10, 11, and 12 under 35 U.S.C. 102(b) as allegedly anticipated by Farber et al, claims 1, 4-6, 8, 11, and 12 under 35 U.S.C. 102(b) as allegedly anticipated by Mahlo, and claim 14 under 35 U.S.C. 102(b) as allegedly being anticipated by Meyer et al is respectfully requested.

Rejections under 35 U.S.C. §102/103 as anticipated by or in the alternative obvious.

Claim 12 was rejected under 35 U.S.C. 102(b) as allegedly anticipated or in the alternative under 35 U.S.C. 103(a) as obvious over either of Amano I (US 5,096,988) and Amano II (US 5,478,900) as set forth on pages 10-11 of the Office Action. The Examiner asserts that claim 12 is drawn to a (co)polymer “obtainable” by the process of claim 1. Further the Examiner asserts that the claimed process results in (co)polymer with reduced levels of fish eyes at high initiator loads. According to the Examiner the cited references each describe vinyl chloride polymers characterized by a small number of fish eyes in a mill-rolled sheet specimen. The Examiner asserts that the similarity in the mutually disclosed property and the identity of polymer composition provide a plausible basis concluding that the cited products of Amano I and Amano II are the same as, or insubstantially different from the currently claimed product. Applicants have canceled claim 12 without prejudice and in order to expedite examination. Therefore, the rejection is now moot. Accordingly, applicants respectfully request withdrawal of the rejection of claim 12 under 35 U.S.C. §

102(b)/ 35 U.S.C. § 103(a) as anticipated by or in the alternative as unpatentable over Amano I or Amano II et al.

Rejections under 35 U.S.C. §103 as obvious.

Claim 10 was rejected under 35 U.S.C. 103(a) as allegedly being obvious over Mahlo as applied to claim 1, and further in view of Marous et al (US 3,022,282) as set forth on page 7-8 of the Office Action. Claims 1, 4, 11, and 12 were rejected under 35 U.S.C. 103(a) as allegedly being obvious over Frenkel (US 5,892,090) as set forth on page 8-9 of the Office Action. Claims 1-4, 6, 11, and 12 were rejected under 35 U.S.C. 103(a) as being obvious over Waanders et al (US 6,803,436) as set forth on pages 9-10 of the Office Action. Claim 13 was rejected under 35 U.S.C. 103(a) as allegedly being obvious over CA 02198814 ("the CA '814 reference") as set forth on pages 11-12 of the Office Action. According to the Examiner Mahlo describes a process wherein the described charge is "slowly fed" to the high pressure line of the polymerization reactor, which process is seen to qualify as one in which the stabilizing additive is "doses" to the polymerization process in the form of a composition comprising a peroxydicarbonate. However, according to the Examiner Mahlo suggests employing other polymerization initiators in connection with the dialkyl peroxydicarbonates an acyl persulfate initiators. Marous is an analogous art according to the Examiner and it would have been obvious to the skilled artisan at the time of the invention to include in the initiator charge in Malo a diacyl peroxide such as benzoyl or lauroyl peroxide in the expectation of realizing improvement in monomer conversion. Further, according to the Examiner Frenkel has disclosed composition containing an organic peroxide compound and one or more oximes in an amount effective to achieve stabilization. The Examiner asserts that the use of the composition in Frenkel in an aqueous dispersion polymerization is expressly suggested. In addition, the Examiner asserts that Waanders et al disclosed organic peroxide formulations comprising reactive phlegmatizers for use in polymerization processes. According to the Examiner Waanders differs from the claimed invention in failing to specifically disclose use of the formulation of Example 1 in an aqueous dispersion polymerization process but it would have been obvious to use the formulation disclosed in Example 1 in a conventional aqueous dispersion polymerization thereby arriving at the claimed invention. The Examiner further asserts that CA '814 is directed to diacyl peroxide formulations having improved stability and reduced composition rate due to the present of an

effective amount of at least one free radical scavenge. According to the Examiner it would have been obvious to the skilled artisan to modify the disclosed composition comprising dibutyl maleate by substituting BPO for a diacyl peroxide.

In response applicants submit that as discussed above in Example 1, Mahlo adds a formulation of 40 wt% diisopropyl peroxydicarbonate dissolved in diethyl maleate to the reaction mixture. This formulation thus contains 40 wt% peroxydicarbonate and 60 wt% diethyl maleate, which means that, based on the weight of organic peroxide, diethyl maleate is used in an amount of 150 wt%. Claim 1, of the presently claimed invention from which claim 10 depends requires, the controlling agent to be used in an "effective amount". As discussed above for ethylenically unsaturated controlling agents, this means amounts of 4-45 wt%, based on the weight of organic peroxide (see page 8, line 27 through page 9, line 1 of the PCT publication), which is significantly lower than the 150 wt% disclosed by Mahlo. A process according to claim 1, involving the use of an effective amount of controlling agent, is disclosed nor suggested by Mahlo, which deficiency is not cured by the teachings of Marous. Claim 10 is therefore novel and non-obvious over Mahlo in view of Marous.

With respect to Frenkel, applicants submit that dosing of peroxide to the reaction mixture at the polymerization temperature is not disclosed or suggested by Frenkel. Claim 1 and its dependent claims 2-12 are therefore also non-obvious over Frenkel. Similarly, Waanders also does not disclose dosing of the peroxide to the reaction mixture at the polymerization temperature. Furthermore, Waanders' Examples disclose formulations containing peroxyester and ethylenically unsaturated solvent in a ratio of 1:1, which corresponds to an amount of ethylenically unsaturated compound, based on the weight of peroxide, of 100 wt%. This is not an effective amount according to present claim 1. A process according to claim 1, involving dosing of an effective amount of peroxide to the reaction mixture at the polymerization temperature is disclosed nor suggested by Waanders. Claim 1 and its dependent claims are therefore non-obvious over Waanders.

With respect to claim 13, the claimed invention relates to a formulation suitable for use in an aqueous dispersion polymerization process of claim 8, said formulation comprising one or more organic peroxides selected from the group consisting of diacyl peroxides of formula I and an effective amount of dibutyl maleate as controlling agent. CA 814 discloses pastes containing BPO (dibenzoyl peroxide) and a freeradical scavenger, such dibutyl maleate (Table 1). As the Examiner correctly states, BPO is not a diacyl peroxide according

to claim 8. Further, pastes are highly viscous and are not suitable for dosing to a running polymerization process, as required by claims 1-8. CA 814 uses its paste for curing unsaturated polyester resins (see Pages 11-13, "Resin Anchor System") and the free-radical scavenger serves to reduce the rate and amount of free benzene formation in the pastes. The present invention, however, relates to an aqueous dispersion polymerisation process and the reduction of fish eyes in the resulting polymer. The skilled person, looking for a way to reduce the level of fish eyes in polymers produced by aqueous dispersion polymerization will not consider CA 814, which relates to a totally different type of technology, to arrive at the claimed invention. Even if the skilled artisan would consider the teachings the skilled artisan would not be taught to reduce the level of fish eyes in polymers produced by the claimed invention. Claim 13 is therefore not obvious over CA 02198814.

Accordingly, the present claims are non-obvious over Mahlo in view of Marous, Frenkel, Waanders et al, and CA '814. Accordingly, applicants respectfully request withdrawal of the rejection of claims 1, 4-6, and 10-13 under 35 U.S.C. § 102(b)/ 35 U.S.C. § 103(a) as obvious over Mahlo in view of Marous, Frenkel, Waanders et al, and CA '814.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the present application is in condition for allowance. Early and favorable action by the Examiner is earnestly solicited. If the Examiner believes that issues may be resolved by a telephone interview, the Examiner is invited to telephone the undersigned at the number below.

Respectfully submitted,
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